



# Stormwater 201 – Infrastructure Program

Presented to the Joint City-County Planning Committee September 11, 2008

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# Stormwater Infrastructure Program Activities

Efforts that address the structural condition and function of an existing drainage system.

- Drainage Investigations
- Drainage Projects
- NFIP Floodplain Management
  National Flood Insurance Program
- Special Projects
- Update Stormwater Inventory





#### What is a Drainage System?

Natural and constructed conveyances for collecting and transporting stormwater, whether publicly or privately owned.

- Lakes, Ponds, Rivers, Streams
- Ditches, Catch Basins/Inlets, Outlets, Pipes, Culverts





#### **Drainage System Extent**

Public Works Department, Stormwater Services



Streams, rivers

Storm drain pipe

Ditches, open channels

Stormwater inlets

Stormwater outlets

1,250 miles

750 miles

260 miles

39,386

9,325



# **Drainage System Responsibilities**



- City of Durham
- Durham County
- > NCDOT
- Property Owners
  - Residential
  - Commercial
  - Industrial
  - Office and Institutional



#### **Drainage Infrastructure Issues**



- > Channel Erosion
- Pipe Failure
- > Flooding
- Obstructions
- Grading/Landscaping





# **Drainage Investigations**



- Assess Conditions
- Suggest Repair Options and Provide Information
- Coordinate Repairs
- > Issue NOVs





#### **Public Education and Outreach**

Public Works Department, Stormwater Services



- > CENAT
- > ComNet

> Keep Durham Beautiful







# **Private Property Assistance Requests**



- Must receive runoff from a public street
- Addressed by severity
  - P1 Clear and immediate danger exists
  - P2 Threat exists but is not immediate
  - P3 Work would reduce damage to property and financial loss

#### **Private Property Assistance Priorities**



Above: Priority 1

Upper Right: Priority 2 Lower Right: Priority 3









#### **Drainage Projects**

- Engineering Analysis
- Design and Plan Preparation
- Permits and Approvals
- Contracting and Contract Management
- Project and Construction Management



#### **Private Property Drainage Assistance Project**





Above: Before Construction

Upper Right: After Construction

Lower Right: Site Today

Cost - \$6,739.00





#### Public Works Department,



#### By the Numbers:

6527

**Drainage Investigations Performed** 

395

Drainage Assistance Projects Completed

\$4.5M

Cost of Completed Assistance Projects

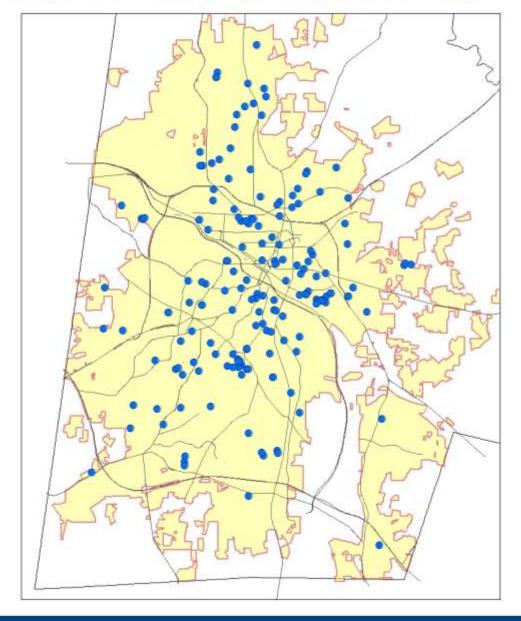
\$11,500

Average Per Property Cost

#### Completed Private Property Drainage Assistance Projects









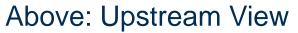


## **Other Drainage Projects**

- Street Maintenance Division
  - Drainage Piping
  - Channel Rehabilitation
  - Culvert Repair/Replacement
- Engineering Division
  - Drainage Studies
- General Services/Parks and Recreation
  - Stream Maintenance
  - Culvert Replacement

#### Major Infrastructure Project: Markham Culvert





Upper Right: Downstream View

Lower Right: Inside Barrel

Estimated Cost - \$1.5M







# The National Flood Insurance Program



- A voluntary program between the Federal government and the local community
- Requires adopting, implementing and enforcing floodplain management ordinance
- Benefits to membership:
  - Federally-backed flood insurance
  - State and Federal disaster assistance
  - Federal loans, grants, payments, subsidies, or rebates for acquisition or construction purposes to properties in the floodplain





## Flood Insurance Rate Maps (FIRMs)

Maps issued by FEMA that show areas of special flood hazard, flood insurance risk zones and other flood-related information.

#### **History of Durham FIRMs:**

- August 2, 2007

January 3, 1979
February 15, 1979
July 15, 1981
February 2, 1996
March 21, 2000
May 2, 2006
City of Durham County
Durham County and City\*
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**Durham City and County** 

<sup>\*</sup> All FIRM panels re-issued for community.

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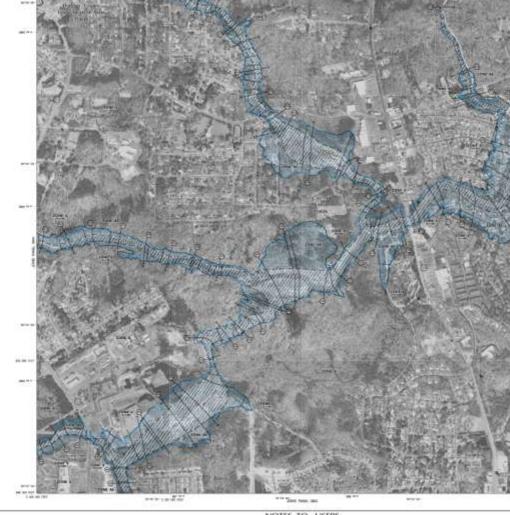
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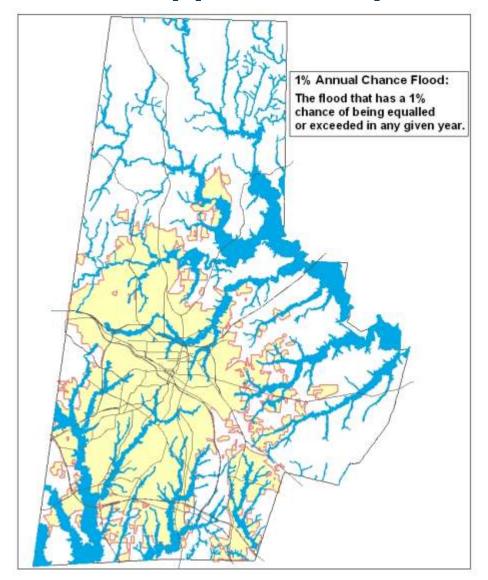
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#### **FEMA Mapped Floodplain**







## NFIP Floodplain Management

- Manage the Community Map Repository
- Provide Floodplain Information to Customers
- Review/Coordinate Requests for Map Revisions
- Check Floodplain Development Permit Applications
- ➤ Technical Resource for Floodplain Administrator

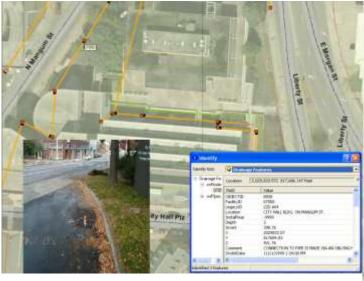


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#### Stormwater Inventory

Public Works Department, Stormwater Services





**Special Projects** 

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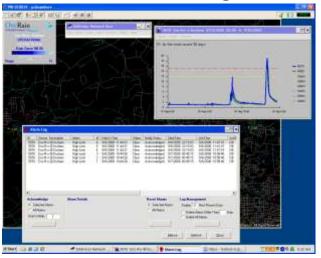
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Public Works Department, Stormwater Services



# **Special Projects (Cont.)**

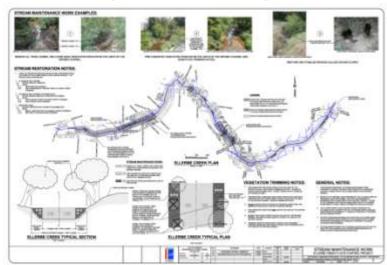
**Eno Flood Warning** 



#### Bid/Construction Docs Update



#### Ellerbe Creek Flood Control





#### What's Next?



- Public Education and Outreach
- Update Stormwater Utility Ordinance
- > GIS Improvements



#### **Looking Toward the Future**



- Floodplain Mitigation Planning
- Proactive ROW Repair and Maintenance
- Planning for expanded Flood Warning System